

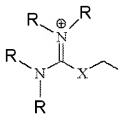
**Listing of Claims:**

1-15 (Cancelled)

16. (Currently amended) A compound ~~comprising~~ consisting of a targeting moiety directly bound to a leaving group that ~~differentiates the compound from an imaging agent derived from said compound so the imaging agent can be separated from said compound after substitution of the leaving group with the detectable species to yield the~~ imaging agent;

~~wherein the leaving group is selected from the group consisting of:~~

(i) groups of the formula:



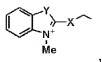
where X is S, O and R can be the same or different at each occurrence and is selected from C<sub>1</sub> to C<sub>20</sub> alkyl groups;

(ii) groups of the formula:



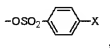
where Y is N or CH;

(iii) groups of the formula:



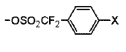
where when X is S, then Y is O or S and where when X is O, then Y is S;

(iv) groups of the formula:



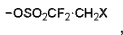
where X is selected from C<sub>4</sub> to C<sub>10</sub> alkylene, -CN, -N<sup>+</sup>(CH<sub>3</sub>)<sub>3</sub>, or -(Q)<sub>n</sub>OCH<sub>3</sub> where Q is C<sub>2</sub> to C<sub>6</sub> alkoxy and n = 1 to 6;

(v) groups of the formula:



where X is selected from C<sub>4</sub> to C<sub>10</sub> alkylene, -CN, -N<sup>+</sup>(CH<sub>3</sub>)<sub>3</sub>, or -(Q)<sub>n</sub>OCH<sub>3</sub> where Q is C<sub>2</sub> to C<sub>6</sub> alkoxy and n = 1 to 6; and

(vi) groups of the formula:



where X is selected from C<sub>4</sub> to C<sub>10</sub> alkylene, -CN, -N<sup>+</sup>(CH<sub>3</sub>)<sub>3</sub>, or -(Q)<sub>n</sub>OCH<sub>3</sub> where Q is C<sub>2</sub> to C<sub>6</sub> alkoxy and n = 1 to 6; and

wherein the targeting moiety is selected from the group consisting of proteins, glycoproteins, lectins, peptides, polypeptides, saccharides, vitamins, steroids, steroid analogs, hormones, cofactors, nucleosides, nucleotides, and polynucleotides.

17. (Cancelled) A compound as in claim 16 wherein the leaving group is bound to a solid support.

18. (Currently amended) A method of producing an imaging agent, said method comprising the steps of:

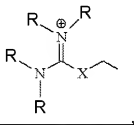
providing a compound ~~that includes~~ consisting of a targeting moiety directly bound to a leaving group that differentiates the compound from the imaging agent derived from the compound so the imaging agent can be separated from the compound after substitution of the leaving group with the detectable species to yield the imaging agent contains a site for regioselective substitution of a detectable species;

contacting the compound with a solution containing the a detectable species to form ~~a reaction mixture~~ the imaging agent; and

recovering the imaging agent;

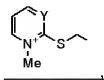
wherein the leaving group is selected from the group consisting of:

(i) groups of formula:



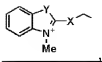
wherein X is S, O and R can be the same or different at each occurrence and is selected from C<sub>1</sub> to C<sub>20</sub> alkyl groups;

(ii) groups of formula:



wherein Y is N or CH;

(iii) groups of formula:



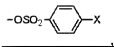
wherein

X is S and Y is O; or

X is S and Y is S; or

X is O and Y is S.

(iv) groups of formula:

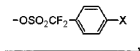


wherein X is selected from C<sub>4</sub> to C<sub>10</sub> alkylene, -CN, -N<sup>+</sup>(CH<sub>3</sub>)<sub>3</sub>, and -(Q)<sub>n</sub>OCH<sub>3</sub>;

Q is C<sub>2</sub> to C<sub>6</sub> alkoxy; and

n = 1 to 6;

(v) groups of formula:



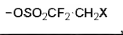
wherein

X is selected from C<sub>4</sub> to C<sub>10</sub> alkylene, -CN, -N<sup>+</sup>(CH<sub>3</sub>)<sub>3</sub>, and -(Q)<sub>n</sub>OCH<sub>3</sub>;

Q is C<sub>2</sub> to C<sub>6</sub> alkoxy; and

n = 1 to 6;

(vi) groups of formula:



wherein

X is selected from C<sub>4</sub> to C<sub>10</sub> alkylene, -CN, -N<sup>+</sup>(CH<sub>3</sub>)<sub>3</sub>, and -(Q)<sub>n</sub>OCH<sub>3</sub>;

Q is C<sub>2</sub> to C<sub>6</sub> alkoxy; and

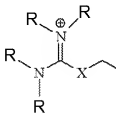
n = 1 to 6; and

wherein the targeting moiety is selected from the group consisting of proteins, glycoproteins, lectins, peptides, polypeptides, saccharides, vitamins, steroids, steroid analogs, hormones, cofactors, nucleosides, nucleotides, and polynucleotides.

19. (Cancelled) A method as in claim 18 wherein the step of providing a compound comprises providing a compound wherein the leaving group is bound to a solid support.

20. (Original) A method as in claim 18 wherein the step of contacting the compound with a solution containing the detectable species comprises contacting the compound with a solution containing <sup>18</sup>F.

21. (New) A compound according to claim 16, wherein the leaving group is a group of formula



where X is S or O; and

R can be the same or different at each occurrence and is selected from C<sub>1</sub> to C<sub>20</sub> alkyl groups.

22. (New) A compound according to claim 16, wherein the leaving group is a group of formula



where Y is N or CH.

23. (New) A compound according to claim 16, wherein the leaving group is a group of formula



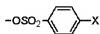
wherein

X is S and Y is O; or

X is S and Y is S; or

X is O and Y is S.

24. (New) A compound according to claim 16, wherein the leaving group is a group of formula



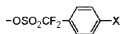
wherein

X is selected from C<sub>4</sub> to C<sub>10</sub> alkylene, -CN, -N<sup>+</sup>(CH<sub>3</sub>)<sub>3</sub>, and -(Q)<sub>n</sub>OCH<sub>3</sub>;

Q is C<sub>2</sub> to C<sub>6</sub> alkoxy; and

n is 1 to 6.

25. (New) A compound according to claim 16, wherein the leaving group is a group of formula



wherein

X is selected from  $\text{C}_4$  to  $\text{C}_{10}$  alkylene,  $-\text{CN}$ ,  $-\text{N}^+(\text{CH}_3)_3$ , and  $-(\text{Q})_n\text{OCH}_3$ ;

Q is  $\text{C}_2$  to  $\text{C}_6$  alkoxy; and

n is 1 to 6.

26. (New) A compound according to claim 16, wherein the leaving group is a group of formula



wherein X is selected from  $\text{C}_4$  to  $\text{C}_{10}$  alkylene,  $-\text{CN}$ ,  $-\text{N}^+(\text{CH}_3)_3$ , or  $-(\text{Q})_n\text{OCH}_3$ ;

Q is  $\text{C}_2$  to  $\text{C}_6$  alkoxy; and

n is 1 to 6.